

CLAIMS

1. A router device for relaying data between a first network and a second network, the router device comprising:

communication data receiving means for receiving communication data including at least one address of a destination from the first network;

communication data storing means for storing therein the at least one communication data received by the communication data receiving means;

communication data sending means for sending the communication data to the second network;

communication data temporal storing means for temporarily storing therein the communication data sent to the second network by the communication data sending means;

destination comparing means for comparing the destination included in the one or more communication data stored in the communication data storing means with the destination included in the communication data stored in the communication data temporal storing means one by one;

communication data transmission controlling means for designating the communication data sending means to transmit the communication data stored in the communication data storing means if a comparison result by the destination comparing means indicates destination matching or if no communication data to be compared is stored in the communication data temporal storing means; and

communication data erasing means for erasing the transmitted communication data from the communication data storing means in response to sending the communication data to the second network by the communication data sending means.

2. The router device according to claim 1, wherein

the communication data transmission controlling means repeats a processing of designating the communication data sending means to transmit the communication data stored in the communication data storing means until no communication data is stored in the communication data storing means if the comparison result by the destination comparing means indicates destination matching or if no communication data to be compared is stored in the communication data temporal storing means.

3. The router device according to claim 1 or 2, further comprising basic data number counting means for counting the number of basic data included in the communication data received by the communication data receiving means, the basic data representing processing contents, wherein

the communication data receiving means includes basic data number information representing the number of basic data counted by the basic data number counting means in the received communication data.

4. The router device according to any one of claims 1 through 3, further comprising received time measuring means for measuring a time when the communication data has been received by the communication data receiving means, wherein

the communication data receiving means acquires received time information representing the received time measured by the received time measuring means, and includes the acquired received time information in the

received communication data in response to receiving the communication data from the first network.

5. The router device according to any one of claims 1 through 4, wherein

the communication data includes data type information representing a type of control, and parameter information representing setting contents in association with the data type information,

the router device further includes data type comparing means for comparing the data type information included in the communication data stored in the communication data storing means with the data type information included in the communication data stored in the communication data temporal storing means, and

the communication data transmission controlling means extracts the parameter information included in the communication data stored in the communication data storing means and designates the communication data sending means to transmit the extracted parameter information as the communication data if a comparison result by the destination comparing means indicates destination matching and if a comparison result by the data type comparing means indicates data type matching.

6. The router device according to any one of claims 1 through 5, further comprising data contents comparing means for comparing data contents of the communication data stored in the communication data storing means with data contents of the communication data stored in the communication data temporal

storing means, wherein

the communication data transmission controlling means counts the number of communication data having the same destination and the same data contents, as a result of comparison by the destination comparing means and as a result of comparison by the data contents comparing means, and designates the communication data sending means to transmit same data number information representing the number of the communication data having the same destination and the same data contents counted by the communication data transmission controlling means.

7. The router device according to any one of claims 1 through 6, wherein a transmission rate of a transmission medium of the first network is higher than a transmission rate of a transmission medium of the second network.

8. The router device according to claim 1, further comprising broadcast message receiving registering means for pre-registering an apparatus which is required to receive the communication data as a broadcast message among the apparatuses connected to the first network and the second network, wherein

the communication data sending means sends the communication data solely to the apparatus which is connected to the second network and is pre-registered by the broadcast message receiving registering means if the communication data transmitted from the first network and received by the communication data receiving means is judged to be the broadcast message.

9. A communication device to be connected to a second network which

is connected to a first network via a router device, the communication device comprising:

recipient communication data receiving means for receiving communication data sent from the router device among communication data sent from the first network, the router device being adapted to sequentially send the communication data having the same destination to the second network; and

recipient communication data storing means for storing therein the at least one communication data received by the recipient communication data receiving means.

10. The communication device according to claim 9, further comprising basic data analyzing means for analyzing basic data included in the received communication data individually, the basic data representing processing contents, if the recipient communication data receiving means sequentially receives the two or more communication data, wherein

the recipient communication data receiving means divides the communication data sent from the router device into two or more basic data based on an analysis result by the basic data analyzing means.

11. The communication device according to claim 9 or 10, wherein the router device sends basic data number information representing the number of basic data by including the basic data number information in the communication data, and

the recipient communication data receiving means interprets that the basic data is single basic data if the basic data number information included in the

received communication data represents 1, and interprets that the basic data is complex data constituted of the basic data of the number corresponding to the basic data number if the basic data number information included in the communication data represents 2 or more.

12. The communication device according to any one of claims 9 through 11, wherein

the router device sends the communication data including one basic data having parameter information, and the at least one parameter information, and

the recipient communication data receiving means copies the basic data by the number corresponding to the number of the parameter information, replaces the parameter information included in the copied basic data with the received parameter information, and interprets that the communication data includes the leading basic data and the basic data of the number corresponding to the number of the received parameter information if the received communication data includes the one basic data, and the at least one parameter information.

13. The communication device according to any one of claims 9 through 11, wherein

the router device sends the communication data including data type information representing a type of control, one basic data having parameter information representing setting contents in association with the data type information, and the at last one parameter information, and

the recipient communication data receiving means interprets that the received communication data includes the leading basic data, and interprets that

the communication data including the data type information identical to the data type information of the leading basic data, and the parameter information different from the parameter information of the leading basic data has been received by the number corresponding to the number of the parameter information if the received communication data includes the one basic data, and the at least one parameter information.

14. The communication device according to any one of claims 9 through 13, wherein

the router device sends the communication data including basic data, and same data number information representing the number of the communication data having data contents identical to each other, and

the recipient communication data receiving means copies the basic data by the number corresponding to the same data number, and interprets the basic data individually if the received communication data includes the basic data and the same data number information.

15. The communication device according to any one of claims 9 through 13, wherein

the router device sends the communication data including basic data, and same data number information representing the number of the communication data having data contents identical to each other, and

the recipient communication data receiving means interprets that the basic data of the number corresponding to the same data number is received if the received communication data includes the basic data and the same data number

information.

16. The communication device according to any one of claims 9 through 15, wherein

the router device sends the communication data including received time information representing a time when the router device has received the communication data, and

the communication device further includes received time analyzing means for analyzing the received time information if the communication data received by the communication data receiving means includes the received time information.

17. A routing method for relaying data between a first network and a second network, the routing method comprising:

a communication data receiving step of receiving communication data including at least one address of a destination from the first network;

a communication data storing step of storing the at least one communication data received in the communication data receiving step into communication data storing means;

a communication data sending step of sending the communication data to the second network;

a communication data temporal storing step of temporarily storing the communication data sent to the second network in the communication data sending step into communication data temporal storing means;

a destination comparing step of comparing the destination included in the one or more communication data stored in the communication data storing means

with the destination included in the communication data stored in the communication data temporal storing means one by one;

a communication data transmission controlling step of designating to transmit the communication data stored in the communication data storing means if a comparison result in the destination comparing step indicates destination matching or if no communication data to be compared is stored in the communication data temporal storing means; and

a communication data erasing step of erasing the transmitted communication data from the communication data storing means in response to sending the communication data to the second network in the communication data sending step.

18. A routing program for relaying data between a first network and a second network, the routing program causing a computer to function as:

communication data receiving means for receiving communication data including at least one address of a destination from the first network;

communication data storing means for storing therein the at least one communication data received by the communication data receiving step (sic);

communication data sending means for sending the communication data to the second network;

communication data temporal storing means for temporarily storing therein the communication data sent to the second network by the communication data sending means;

destination comparing means for comparing the destination included in the one or more communication data stored in the communication data storing means

with the destination included in the communication data stored in the communication data temporal storing means one by one;

communication data transmission controlling means for designating the communication data sending means to transmit the communication data stored in the communication data storing means if a comparison result by the destination comparing means indicates destination matching or if no communication data to be compared is stored in the communication data temporal storing means; and

communication data erasing means for erasing the transmitted communication data from the communication data storing means in response to sending the communication data to the second network by the communication data sending means.

19. A computer-readable recording medium recorded with a routing program for relaying data between a first network and a second network, the routing program causing a computer to function as:

communication data receiving means for receiving communication data including at least one address of a destination from the first network;

communication data storing means for storing therein the at least one communication data received by the communication data receiving step (sic);

communication data sending means for sending the communication data to the second network;

communication data temporal storing means for temporarily storing therein the communication data sent to the second network by the communication data sending means;

destination comparing means for comparing the destination included in the

one or more communication data stored in the communication data storing means with the destination included in the communication data stored in the communication data temporal storing means one by one;

communication data transmission controlling means for designating the communication data sending means to transmit the communication data stored in the communication data storing means if a comparison result by the destination comparing means indicates destination matching or if no communication data to be compared is stored in the communication data temporal storing means; and

communication data erasing means for erasing the transmitted communication data from the communication data storing means in response to sending the communication data to the second network by the communication data sending means.